The South Carolina 2-Way Interactive Video Project Evaluation Report 1997-2000

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Executive Summary

The South Carolina 2-Way Interactive Video Projects began in summer 1996 as one of the K-12 School Technology Partnership Initiatives. The focus of the Partnership is to provide South Carolina schools with connectivity and capacity so that schools can integrate the current and rapidly developing telecommunications systems for teaching and learning. Interactive distance learning is one of several initiatives undertaken through a public/private partnership funded by the South Carolina General Assembly to include the leadership of the South Carolina State Budget and Control Board, Office of Information Resources, the State Department of Education, South Carolina Educational Television, the Lightstar Partners, and BellSouth. The Partnership now includes the South Carolina State Library.

The purpose of the project was to put in place the hardware, software, connecting infrastructure, and staff development for interactive two-way distance learning. Because interactive two-way telecommunications systems have been developed primarily to support individual conferencing in business, industry, and government, very little was known at the time about it potential applications in K-12 education. The project was funded to provide immediate access to courses that would not otherwise be available to students especially those in rural areas. It was also funded to test the potential of this mode of communication to support and enhance education in South Carolina.

The findings from the evaluation include the following:

Technical Components, Outcomes, and Connectivity

♦ The technical components originally proposed are in place and functioning for all projects
♦ 40 schools are connected as well as Aiken, Piedmont, Trident, and York Technical Colleges; 4 district offices; and Lander University, University of South Carolina-Aiken, 1 career center using money from the K-12 Pilot Project.
♦ A total of 2,712 students, 1,386 of whom were distance learners have participated in the projects.
♦ A total of 146 courses have been offered from 112 originating schools to a total of 221 receiving schools. Of these courses, 77 were for high school credit only (primarily advanced placement or college preparation), 30 were for college credit, and 36 were offered for dual credit.

♦ Project Directors indicate that the systems that are in place are fully functional and working well with signal quality, network dependability, and equipment dependability rated very highly.

♦ The quality of staff training for faculty and technical staff has not been ranked as highly

♦ The major "next level of effectiveness" suggested by the Project Directors is to add additional sites and the need to decrease the connectivity charges. The average annual costs for connectivity are now $60,788 per project.

Faculty Surveys

♦ Faculty completed surveys in the fall 1999 and spring 2000. There was very little difference in their responses.

♦ Faculty who had taught a particular course in its traditional environment were most often the first to employ the distance teaching technology to deliver classes.

♦ Most often, course selection was made based on the experience and perceptions of principals and guidance counselors. Two of the projects used faculty and community committees to get input for course selection.

♦ In almost all of the projects, course delivery was primarily a matter of a traditional face-to-face experience migrating into a different delivery system.

♦ Faculty report being open to suggestions for teaching more effectively with the available technologies and have indicated that they would appreciate both continued staff development in this area and exchanges of ideas with faculty in other projects.

♦ Most faculty teaching via two-way video had either volunteered or were recruited for the project.

♦ A few felt that they had been given complete instruction in how to use the technology related to delivering the course and many indicated that they were given "very little" instruction.

♦ A majority of teachers rated the technical support they received to deliver the two-way video courses as good to excellent.

♦ Less than half of the teachers surveyed rated administrative support for their two-way video teaching as good or better.

♦ Almost all of the faculty participating in two-way video delivery had taught the same course previously in a traditional classroom.

♦ Most answered "yes" when asked if they used a variety of teaching tools and techniques to deliver the two-way video course with a majority of the responding teachers indicating that they used a greater variety of teaching tools and techniques in the two-way video course than in a standard classroom.

♦ Over a third rated their use of teaching tools and techniques in two-way video and traditional courses as about the same.

♦ Well over half felt the level of pupil involvement was about the same as a traditional class; however, almost a third indicated that student participation was "not as much" in the two-video course as in a regularly delivered one.

♦ Teachers were "mixed" in the opinions regarding whether teaching via two-way video has impacted positively on their teaching. About one-fourth felt the experience

had contributed to their success as a teacher, but almost one-third believed that teaching via two-way video had "interfered" with their teaching success. The others saw no difference in impact on successful teaching.

♦ A majority of teachers surveyed concluded that student contacts outside the two-way video courses were about the same as with traditional classes.

♦ A majority of responding teachers felt that students learned the course material about the same as they would with traditional delivery as well as grades earned by students within the two-way video experience

♦ Almost half stated that students at the originating site achieved higher grades.

♦ A majority checked "yes" when asked if they would again be willing to teach their course using the two-way video system. And, slightly over two-thirds of these teachers would recommend to their colleagues that they deliver courses via the two-way video system.

Student Surveys

♦ Students were asked to complete a survey during fall 1999 and spring 2000. As with teachers, there was little difference to be noted in the responses from one semester to the next.

♦ About half the students were taking the two-way video course for college credit

♦ Slightly more than half the students in the two-way video courses took the class at a remote site.

♦ For a majority of students participating in a course delivered by two-way video was not an unexpected experience.

♦ However, a sizable number (39.2%) of other students stated that they did not know ahead of time that their class would be taught using two-way video in the fall survey, but all apparently knew that they were to take the course in the spring 2000.

♦ A majority of students indicated that the took the two-way video course because that was the only way it was available for them.

♦ Only about half of the responding students believed that their two-way video teachers were skilled in using the system. However, many indicated their teachers' skills using the two-way system improved during the course.

♦ Twenty percent of the students reported that the two-way video courses often experienced technical difficulties in the fall and 16% in the spring.

♦ Most students at remote sites reported that a facilitator was present when the two-way courses were being delivered.

♦ Students generally did not feel that teachers used a variety of teaching methods very often in the two-way video. Another third of the students did indicate that their teachers used a variety "sometimes. Nearly twenty percent stated that their teachers either "not very often" or " rarely if ever" used multiple teaching methods. A majority of the two-way video students believed that their two-way video teachers used at least the same or more teaching methods compared to what they experienced in standard courses.

♦ About half the student participants felt as comfortable asking questions and participating in the two-way video class format as in a traditional setting.

- Over one-third preferred the regular classroom setting when engaging in class exchanges. Interestingly, nearly fifteen percent were more comfortable asking questions and entering into discussions within the two-way video framework than in the standard classroom.
- A sizable majority of students participating in two-way video classes thought that their knowledge of the subject matter had increased.
- A large majority felt they had learned as much or more as would have been the case in a traditional class setting.
- Over half indicated they definitely would recommend someone else take a course using two-way video.
- The two concerns most often listed were
- technical difficulties, and not having the teacher in the room.
- Students indicated that they liked most the interaction with other schools, meeting new people, getting to know other students, earning college credit, and having a different experience.

Partnerships
- The partnerships established thus far primarily have been those developed among the partners at the state level. However, there are notable examples of schools working with technical colleges, other institutions of higher education collaborating with schools for student courses and faculty development, and some local education/business partnerships. The projects are just now reaching the point that they are beginning to consider sharing expertise and courses among themselves.

Management and Costs
- Generally, the projects have been fiscally managed well.
- There is a continuing need to develop stronger lines of communication among many of the schools in the various projects.
- The projects developed as a part of a larger networking plan naturally have progressed more rapidly; however, with one exception the projects as proposed have met their goals and objectives.
- Records keeping has not been as complete as needed to monitor and assess the overall operations of the various project elements.
- The total reported costs of the projects to date amount to $6,111,919.
- The total one time costs of the projects to date amount to $3,153,124 which means the cost per course offered is $22,050, the cost per receiving school is $14,268, and the cost per distant student is $2,232
- Technology staff costs average $38,050 per year for the projects.
- Factoring in all the operating costs the total costs for the first three years of operation is $4,257,026 for the courses delivered. This breaks down to $1,566 per student, $14,885 per course, and $19,263 per receiving school.
- The annual operating expenses reported for the each course costs $17,242 per year, $698 per distant learner, $907 per student for all learners, and $11,57 for each receiving school.

- The total costs for the six years is projected to be $5,360,928. The cost per student for the first three years is $1,566 and at the end of the six years is projected to be $986. Per course the range goes from $14,885 to $9,372 and per school from $19,263 to $12,129.
- If the same number of courses as offered using the distance delivery systems were to be offered in individual schools, the cost just for instructional staff would be $150,548,972. Using distance delivery systems with one faculty teaching to one or more other schools, the cost is $76,296,312.
- A more realistic cost avoidance is suggested to be over one million dollars over the 6 years of the project if all cost elements remain the same.
- It is obvious that the schools served, most of which are rural and in economically depressed areas, could not afford the larger figure regardless of how many courses they could not get for their students.

Continued Staff Development and Enrichment
- Most of the Project Directors indicated that they had offered limited staff development for their distance teachers and a few indicated that they had used the system to bring in staff development for other teachers.
- The use of the systems for this purpose was very limited and additional uses need to be considered.
- There appears to be limited use of the systems beyond class delivery which needs to be carefully considered by local directors if they expect to develop a cost effective system.

Recommendations
1. Competitive grants must be the way of funding future projects.
2. Staff (faculty, administrative, and technical) development for distance learning is badly needed.
3. Reduced Rates for connectivity must be a goal.
4. Funding for SC schools is needed if the efforts in distance learning are to be built upon.
5. Collaboration and cooperation among projects and systems in the State are essential if we are to realize the full potential of our investments.

Background

The South Carolina 2-Way Interactive Video Projects began in summer 1996 as one of the K-12 School Technology Partnership Initiatives. The focus of the Partnership is to provide South Carolina schools with connectivity and capacity so that schools can integrate the current and rapidly developing telecommunications systems for teaching and learning. Interactive distance learning is one of several initiatives undertaken through a public/private partnership funded by the South Carolina General Assembly to include the leadership of the South Carolina State Budget and Control Board, Office of Information Resources, the State Department of Education, South Carolina Educational Television, the Lightstar Partners, and BellSouth. The Partnership now includes the South Carolina State Library.

The purpose of the project was to put in place the hardware, software, connecting infrastructure, and staff development for interactive two-way distance learning. Because interactive two-way telecommunications systems have been developed primarily to support individual conferencing in business, industry, and government, very little was known at the time about it potential applications in K-12 education. The project was funded to provide immediate access to courses that would not otherwise be available to students especially those in rural areas. It was also funded to test the potential of this mode of communication to support and enhance education in South Carolina.

There were no formal calls for proposals. Rather the Video Pilot Coordinating Committee identified eight projects around the state that had investments in distance learning in place or were in the final planning stages of distance learning programs. Strongest consideration was given to those programs that were attempting to meet the needs of rural students. Members of the Video Pilot Projects Committee (Appendix A) contacted a number of potential project directors, and in July 1996 proposals were submitted from eight of those contacted: Aiken Public Schools, the Beacon Project, Berkeley County Schools, the Governor's School for Science and Math, Horry County Schools, Orangeburg District 5, Piedmont Educational Network, and Trident Technical College. Using the teleconferencing system in place at the State's Technical Colleges, presenters from each of the eight projects defended their proposal before the Committee.

All eight of the projects were funded and became Phase I of the K-12 Distance Education Initiative.

The following report is a culmination of the evaluation process of Phase I of the K-12 Distance Education Initiative.

Phase II of the Initiative began in fall 1999 with a call for grant proposals from the K-12 Partnership. In a competitive process involving the K-12 Partnership and the members of the Phase I Evaluation Team, $3.1 million dollars were awarded and innovative learning opportunities have been extended to Allendale County Schools, Anderson District Five, Greenville County Schools, Kershaw County Schools, Lee County Schools, Lexington/Richland District Five, Orangeburg Four, the Pee Dee Consortium, Richland School District Two, and Sumter School District Two.

The evaluation of Phase II of the Initiative began with the Evaluation Team working with the Phase I and Phase II Project Directors to determine the optimum use of time and resources. The evaluation during the second phase will build significantly upon the work of the Projects to date and will provide a significant baseline from which to evaluate other projects in distance learning.

Evaluation Team

The Evaluation Team (Appendix B) was selected based on proposals submitted to the Committee and began its work in the spring of 1997. The Team committed its efforts to maintain an outside, objective view of the activities of the projects; however, they also offered to work with any of the projects to develop evaluation process and instruments consistent with the stated objectives of the projects. Local school systems over the years have been given increasingly greater autonomy in managing schools and programs. Based on the expressed wishes of the Project Directors with their assurance that they would provide quarterly reports on their progress and that those end-of-term evaluations from students and teachers, common reporting forms and data gathering instruments were not created.

Evaluation to date has been based primarily on surveys completed by the Project Directors; onsite visits by the Team; examination of quarterly reports and end-of-term evaluations submitted by the Project Directors; and focused conversations with Project

Directors, teachers, students, and technical staff. With the Legislative mandate coming from Proviso 72.57 to demonstrate outcomes and comparisons of various learning strategies, the Project Directors agreed to collectively develop with the assistance of the Evaluation Team a set of instruments and process by which each element of the Proviso could be addressed. This was put into place in the fall 1999 and will be a required component of all funded projects henceforth. Working with the Project Directors at 2 Regional Workshops which were developed by the Office of the Governor with the assistance of the Evaluation Team, at annual conferences, and during onsite visits by the Team, a system of data gathering was created that will enhance the implementation of the projects as well as provide useful data for overall project evaluation.

Overall Observations

All parties associated with the project were overly optimistic at the beginning in terms of the time that they believed was required to set up and implement course and staff development opportunities using the new systems. With the exception of the Governor's School for Science and Math and the Berkeley projects, both of which had exiting delivery systems in place, the projects took a good deal longer than originally planned to become fully functional and provide courses and staff development.

Although it was clearly stated in the guidelines for proposals that each project was to complete an evaluation of its efforts and provide quarterly reports, the degrees of specificity and rigor varied greatly among the projects. A number of the projects had not been planned with an objective to gather data related to areas that usually are associated with evaluating new programs, teaching techniques, learning outcomes, or system responsiveness. Frankly, most of the projects did not have the local expertise to create such instruments and processes. Also the cultural of local control and a lack of models for collaboration added to the difficulty in gathering meaningful data from the projects in the beginning. Few of the projects completed formal evaluations beyond student perceptions on survey forms and anecdotal information gathered by the Project Directors from faculty, students, and administrators that were summarized by the Project Directors.

The first year of the Project was a building year--connecting the schools, putting hardware into place, and getting a few faculty ready to teach for the first time using

distance education. Approximately ten courses were offered during the spring and fall of 1997 by six of the projects with 135 students participating in them. The Aiken and PEN projects were exceptional in terms of effective and efficient deployment of the technologies, faculty and student support, and innovative use of the technologies. Two of the projects began as planned in the spring 1997 (the Governor's School for Science and Math and Berkeley) as had been anticipated from the beginning of the Project. The PEN program used its already sophisticated delivery system to link this project quickly into its ongoing operation.

Clearly, the most successful projects were those in which the local leadership has invested previously in technology planning efforts and had dedicated staff to support the projects. Also, the success of the projects has primarily rested on the shoulders of a person or office that championed the project. Another criteria for success was the extent to which local educational administrators were actively involved in the projects and worked toward removing the traditional barriers such as bell schedules--one of the major hurdles that remains to be solved.

The Initial Evaluation Process

Beginning in spring 1998, all of the projects were fully operational with two exceptions that resulted primarily from scheduling and communication problems among the various groups necessary for the projects to become operational. A survey instrument was developed and administered by the Evaluation Team at the end of the fall 1998 spring 2000 semesters to all the Project Directors. A total of seven of the eight Project Directors returned fully completed questionnaires. The complete list of the conclusions and recommendations from the evaluation process are included in Appendix C. In the Summer 1999, the Project Directors and the Evaluation Team met to determine if common evaluation and assessment instruments and processes could be developed that would provide for cross project data comparisons. The results of that effort are in Appendix D. These instruments and processes were implemented in the fall 1999 and replicated in spring 2000. The remainder of this document contains the report of those data as well as discussion of the overall project outcomes.

Overall Connectivity and Output

The technical components originally proposed are in place and functioning according to the Project Directors and onsite visits by members of the Evaluation Team. All but one of the projects have met or exceeded the originally proposed number of sites to be connected. The original proposals indicated that thirty-three k-12 schools; 2 district offices; 6 technical colleges; 5 other institutions of higher education; 1 vocational school; and the Governor's School for Science and Mathematics were to be linked-- a total of 48 connections. In the spring 1998, 349 students participated in courses offered over the systems and 121 staff participated in development activities using them. In the fall 1998, 48 sites had provided at least 36 courses to some 672 students.

According to the data submitted by the Project Directors in the fall 1999 and spring 2000 (Table 1), a total of 2,712 students, 1,386 of whom were distance learners have participated in the projects. A total of 146 courses have been offered from 112 originating schools to a total of 221 receiving schools. Of these courses, 77 were for high school credit only (primarily advanced placement or college preparation), 30 were for college credit, and 36 were offered for dual credit. A total of 64 schools are now connected within the original Pilot Projects. The complete description of the offerings in the Project Case Studies found in Appendix K.

Table 1
South Carolina Distance Learning Initiative
Process Outcomes
1997-2000

Project	Courses	DE	All	Receiving	Originating	Schools
	Provided	**Students**	**Students**	**Schools**	**Schools**	**Connected**
Aiken	36	385	719	41	35	8
Beacon	29	291	620	41	12	5
Berkeley	28	314	622	49	28	7
GSSM	12	163	163	35	1	18
Horry	14	94	198	20	17	8
Oburg 5	0					
PEN	18	90	293	18	18	14
Trident	6	76	104	17	1	4
Total	143	1,413	2,719	221	112	64

Delivery Systems Evaluation

According to the Project Directors' feedback on surveys and onsite interviews, the systems that are in place are fully functional and working well. As with any technology, constant monitoring and updating are necessary. Signal quality, network dependability, and equipment dependability are rated very highly. The quality of staff training, however, has not been ranked as highly. The major "next level of effectiveness" suggested by the Project Directors is to add additional sites and the need to decrease the connectivity charges. A complete summary of their responses is found in Appendix E.

The Evaluation Team worked with the Project directors in the fall 1999 and spring 2000 to assure accuracy in reporting, yet not burden them with more paperwork than was necessary. The original spreadsheets for each project displaying the data from the fall survey were returned to the Project Directors with a request to update the figures as necessary. They affirmed that the figures for the first three years of the projects are accurate as represented in the tables and text below and in the tables appearing in the appendixes. The average annual costs for connectivity reported is $60,788 per project (Table 2) The lowest being the Aiken Project ($19,320) and the most expensive the Berkeley Project ($86,550). The complete description of connectivity costs can be found in the Project Case Studies in Appendix K.

Table 2

Annual Connectivity Costs by Project
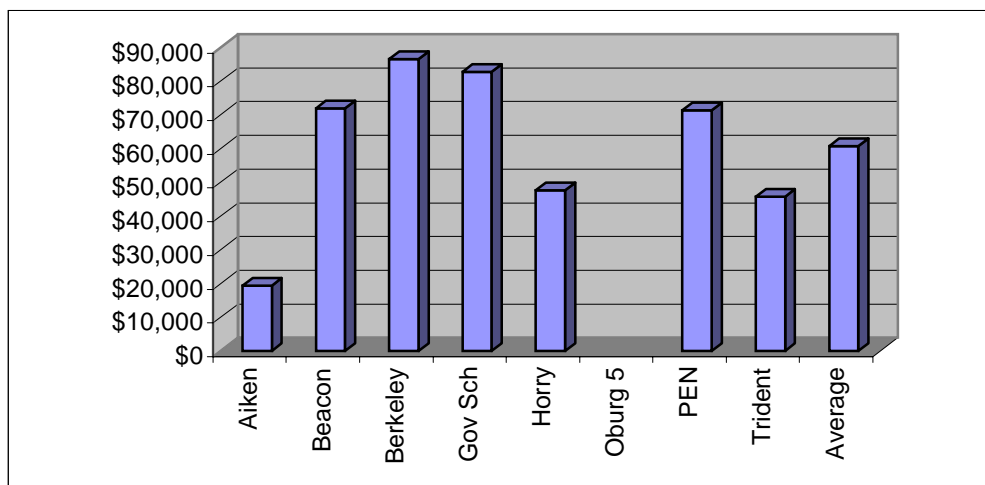
Learning Goals and Objectives Evaluation

Based on the observations of the Evaluation Team, faculty primarily used existing course goals and objectives with the interactive system to reach students who had either had to travel from their schools to get these courses or would not have had the opportunity to take these courses at all. Also, faculty who had taught a particular course in its traditional environment most often were the first to employ the distance teaching technology to deliver classes. Most often, course selection was made based on the experience and perceptions of principals and guidance counselors. Two of the projects used faculty and community committees to get input for course selection.

In almost all of the projects, course delivery was primarily a matter of a traditional face-to-face experience migrating into a different delivery system. This is not necessarily a negative observation. Practically all institutions and groups who first begin using distance delivery systems initially take what they have done in the traditional classroom and accommodated that to the new delivery system. However, according to the literature, distance delivery of courses is often a catalyst for changing not only the method of delivery, but also techniques and teaching styles in the traditional classroom. During site visits in January and February 1999, meetings at the Regional Workshops in spring and summer 2000, and site visits in spring 2000, the Evaluation Team found faculty open to suggestions for teaching more effectively with the available technologies. In fact, most indicated that they would appreciate both continued staff development in this area and exchanges of ideas with faculty in other projects. (Please see Appendix E for a complete description of the Project Directors' comments and survey results.)

Faculty Surveys

Each faculty member that participated in the two-way pilot projects were asked to complete a survey in fall 1999 and spring 2000. The results of those surveys follow.

Fall 1999 Narrative (Charts and Tables in Appendix F)

One component of the fall 1999 evaluation process was a survey of teachers participating. Following is a narrative summary of the set of tables and charts found in Appendix F detailing the responses to each questionnaire item.

Most faculty teaching via two-way video had either volunteered (47.4%) or were recruited for the project (42.1%). About ten percent did indicate they were "drafted" to participate. Interestingly, almost two-thirds (63.2%) had taught via two-way video previously. Similarly, about two-thirds (67.4%) had been given from several months to at least a semester to plan for their 1999 two-way video course. However, only about one quarter (26.3%) felt that they had been given complete instruction in how to use the technology related to delivering the course. Nearly one-third (31.6%) indicated that they were given "very little" instruction. For those receiving staff development regarding use of technology, more than two-thirds did find it to be good to excellent (68.4%). Most teachers (73.7%) participating in two-way video experience were involved with "multi-site" delivery as opposed to point-to-point.

A majority of teachers (52.6%) rated the technical support they received to deliver the two-way video courses as good to excellent. However, one in ten felt that technical support was poor, and about thirty percent (31.6) judged technical support as "fair." Only about 40% (42.2%) of the teachers surveyed rated administrative support for their two-way video teaching as good or better. Over fifteen percent (15.8%) rated administrative support as "poor" with another 30 plus percent (31.6%) feeling it was only "fair." However, a large majority (84.2%) of teachers returning the questionnaire indicated that their interactions with the remote site facilitators were good to excellent.

Almost all (94.7%) of the faculty participating in two-way video delivery had taught the same course previously in a traditional classroom. And, most (78.9%) answered "yes" when asked if they used a variety of teaching tools and techniques to deliver the two-way video course. A majority (57.9%) of the responding teachers also indicated that they used a greater variety of teaching tools and techniques in the two-way video course than in a standard classroom. Another thirty percent (31.6%) rated their use of teaching tools and techniques in two-way video and traditional courses as about the same. When asked about student participation in two-way video courses versus those delivered traditionally, approximately two-thirds of the teachers (63.2%) felt the level of pupil involvement was about the same. However, almost a third also indicated that student participation was "not as much" in the two-video course as in a regularly delivered one.

Teachers were "mixed" in the opinions regarding whether teaching via two-way video has impacted positively on their teaching. About one-fourth (26.3%) felt the experience had contributed to their success as a teacher, but almost one-third (31.6%) believed that teaching via two-way video had "interfered" with their teaching success. The others saw no difference in impact on successful teaching.

A majority of teachers (57.9%) participating in the Two-Way Video Experience did have specific times for their students to contact them outside of class. The way students contacted these teachers was varied, and included person-to-person, telephone, email, and, in one case, video conferencing. Student assignments were submitted via a variety of ways including mail, email, and fax. A majority of teachers (63.2%) surveyed concluded that student contacts outside the two-way video courses were about the same as with traditional classes.

When rating the overall impact of teaching by two-way video, a majority of responding teachers (63.2%) felt that students learned the course material about the same as they would with traditional delivery. When asked about grades earned by students within the two-way video experience (in the originating class versus remote site), teachers varied in how they rated the impact. No teachers indicated that two-way video classes resulted in higher student grades for students at remote sites. About forty-percent (42.1%) did indicate that the grades were about the same for students at the originating site and at remote sites. However, almost half (47.4%) stated that students at the originating site achieved higher grades.

Though faculty did indicate some problems and frustrations with teaching using the two-way video approach, a large majority (84.2%) checked "yes" when asked if they would again be willing to teach their course using the two-way video system. And, slightly over two-thirds of these teachers would recommend to their colleagues that they deliver courses via the two-way video system.

Spring 2000 Narrative (Charts and Tables in Appendix G)

Most faculty teaching via two-way video had either volunteered (37.5%) or were recruited for the project (31.3%). Twenty-five percent did indicate they were drafted to participate. Half (50.1%) of the faculty had taught via two-way video previously. Nearly

half (43.8%) indicated they had been given from several months to at least a semester to plan for their 2000 two-way video course. Interestingly, an equal amount (43.8%) indicated that they were given very little instruction. None of the faculty (0%) felt that they had been given complete instruction in how to use the technology related to delivering the course. For those receiving staff development regarding use of technology, over half (56.3%) did find it to be good to excellent. Similarly, over half (56.3%) participating in two-way video experience were involved with point-to-point delivery as opposed to multi-site delivery.

A majority of teachers (81.3%) rated the technical support they received to deliver the two-way video courses as good to excellent. Less than one-tenth (6.3%) felt that technical support was poor, and that same amount (6.3%) judged technical support as fair. Slightly more than two-thirds (68.8%) of the teachers surveyed rated administrative support for their two-way video teaching as good or better. Over eighteen percent (18.8%) felt administrative support was only fair, but none of the participating faculty felt that it was poor. Three-fourths (75.1%) of teachers returning the questionnaire indicated that their interactions with the remote site facilitators were good to excellent.

Over two-thirds (68.7%) of the faculty participating in two-way video delivery had taught the same course previously in a traditional classroom. More than one-third (37.5%) answered yes when asked if they used a variety of teaching tools and techniques to deliver the two-way video course. Nearly half (43.8%) of the responding teachers rated their use of teaching tools and techniques in two-way video and traditional courses as about the same. Nearly one-fifth (18.8%) indicated that they used a greater variety of teaching tools and techniques in the two-way video course than in a standard classroom. When asked about student participation in two-way video courses versus those delivered traditionally, over one-half of the teachers (56.3%) felt the level of pupil involvement was about the same. However, about forty-three percent (43.8%) indicated that student participation was not as much in the two-video course as in a regularly delivered one.

Teachers were mixed in the opinions regarding whether teaching via two-way video has impacted positively on their teaching. Over one-third (37.5%) felt their success in teaching was about the same as in a regular class, and about six percent (6.3%) felt the experience had contributed to their success as a teacher. However, a little over half

(56.3%) believed that teaching via two-way video had interfered with their teaching success.

A majority of teachers (56.3%) participating in the Two-Way Video Experience did have specific times for their students to contact them outside of class. The way students contacted these teachers was varied, and included person-to-person, telephone, email, and, video conferencing. Student assignments were submitted via a variety of ways including mail, email, and fax. Almost thirty-eight percent (37.5%) of teachers surveyed concluded that student contacts outside the two-way video courses were about the same as with traditional classes.

When rating the overall impact of teaching by two-way video, a majority of responding teachers (56.3%) felt that students learned the course material about the same as they would with traditional delivery. When asked about grades earned by students within the two-way video experience (in the originating class versus remote site), teachers varied in how they rated the impact. About thirty-eight percent (37.5%) indicated that the grades were about the same for students at the originating site and at remote sites, and about six percent (6.3%) indicated that two-way video classes resulted in higher student grades for students at remote sites. However, another thirty-eight percent (37.5%) stated that students at the originating site achieved higher grades.

Though faculty did indicate some problems and frustrations with teaching using the two-way video approach, half (50%) of the faculty checked yes when asked if they would again be willing to teach their course using the two-way video system. Also, half (50%) of those participating would recommend to their colleagues that they deliver courses via the two-way video system.

Learning Outcomes Assessment
Learning outcomes from individual courses have been reported by most schools in terms of students' grades and, to a lesser extent, student evaluations. Beginning in the fall 1999 other measures of learning outcomes were requested from the Phase I project schools. In the Fall 1999 evaluation process individual students were asked to complete a course evaluation that was the same among all of the projects and faculty were asked to complete a Learner Outcome form that described other learning outcomes such as grades,

days absent, and standardized test scores. The latter was completed with limited success; however, from the existing data, it appears that there are few if any differences between distance learner outcomes and those at the originating sites. During Phase II of the Initiative, with the processes in place and their importance in mind among all of those involved, other learning outcome measures will be implemented for cross project comparisons. Of the 187 student grades that were reported, there are some differences between the grades of students participating in the courses at receive sites and those at the origination sites. This is not a statistically significant number, and care must be taken not to draw broadly based conclusions on such a limited sample. However, these figures are in keeping with the reports of research from other similar populations that indicate that there is little if any difference in the test scores and grades of distant learners and those at the origination sites.

Table 3
Comparison of Student Grades at Origination and Distant Sites
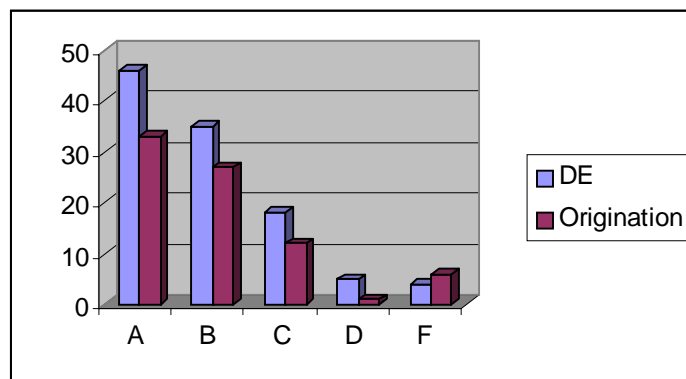
In the spring 2000, the Project Directors expressed concern that gathering grades and other information related to students that could become public information could be in violation of the FURPA opinions. The Evaluation Team requested information from the State Department of Education Legal Office and they too were not comfortable with gathering student records in such small numbers that individuals could possibly be singled out. Because the research literature is so clear in the area of comparative delivery systems, such comparisons appear to be a wasted effort, especially if there is some potential for litigation or even simple impropriety. For this reason, the Evaluation Team

has relied more heavily on conversations with Project Directors and obtaining information from faculty and students for the spring 2000 data gathering and in conversations with these groups onsite.

Student Surveys

Each student that participated in the two-way pilot projects was asked to complete a survey in fall 1999 and spring 2000. The results of those surveys follow.

Fall 1999 Narrative (Charts and Table in Appendix H)

The survey of students was successful and the descriptions here are for the data and tables that follow. The full set of tables and outcomes are included in Appendix G.

The general demographics of the students participating in courses delivered via the two-way video system are as follows. A majority of the student participants were female (65%). About half (50.5%) were twelfth graders with the remaining students fairly evenly divided among grades 9, 10, and 11. A majority (65%) of the students taking two-way video courses was white. About half the students (53%) were taking the two-way video courses as an elective, while the other half (47%) were taking the classes as required courses. About half the students were taking the two-way video course for college credit, while one-third were seeking regular school credit alone, and about fifteen percent were enrolled for a combination of school and college credit. Slightly more than half the students (50.1%) in the two-way video courses took the class at a remote site, while slightly less than half participated in the broadcast studio location. The median response (149) to the question regarding how many fellow students were at the same location taking the two-way video course was "10 to 20 others." However, five students indicated they were participating alone at their location, and twenty-seven said they were with more than 20 other students. Slightly over half (53%) of the students were taking their first two-way video course. However, ten students indicated they had taken five or more classes that were offered by this format.

For a majority of students (60.6%), participating in a course delivered by two-way video was not an unexpected experience. However, a sizable number (39.2%) of other students stated that they did not know ahead of time that their class would be taught using

two-way video. A majority (62.2%) of students indicated that they took the two-way video course because that was the only way it was available for them. Interestingly, nonetheless, was the fact that about one in ten took the course in the new format because they "wanted to try a new way."

Nearly two-thirds of the students (65.5%) felt that the two-way video course objectives and schedule were made clear to them from the beginning. And, about sixty percent (60.6%) indicated that these were provided in writing. A large majority (82.5%) checked "yes" when asked if homework and other written assignments were made clear to them in the two-way video classes. Similarly, a large number (93.4%) stated that the two-way video class written assignments and exams were related to the course objectives.

A majority of students generally felt that assignments, homework, and exams related to their two-way video course were returned quickly (37.2% = almost always, 29.0% = most of the time).   Half (50.9%) of the students indicated that assignments were returned in three days or less. And, another third (31.2%) received their assignments back in 5 days for less. A third of the students in the two-way video classes indicated that their assignments were returned slower than in standard courses. However, about two-thirds (64.3%) of the two-way video students believed assignments were returned as quick or quicker compared to traditionally delivered classes.

A majority (60.6%) of students stated that two-way video course instructors did set specific times for students to contact them outside class hours. However, slightly less than half indicated that they actually contacted their teachers some or often. Students contacting teachers used a variety of methods including the telephone, email, mail, and fax. Similarly, assignments were submitted via mail, fax, and email.

Only about half (50.1%) of the responding students believed that their two-way video teachers were skilled in using the system. However, nearly forty percent (39.8%) indicated their teachers' skills using the two-way system improved during the course. Twenty percent of the students reported that the two-way video courses often experienced technical difficulties. Most students at remote sites reported that a facilitator was present when the two-way courses were being delivered.

Students generally did not feel that teachers used a variety of teaching methods very often in the two-way video courses (only 36.6% checked the "often" response).

Another third (33.1%) of the students did indicate that their teachers used a variety "sometimes. Nearly twenty percent (19.5%) stated that their teachers either "not very often" or " rarely if ever" used multiple teaching methods. Interestingly, though, a majority (78.8%) of the two-way video students believed that their two-way video teachers used at least the same or more teaching methods compared to what they experienced in standard courses. When asked to name the media and teaching methods teachers used in the two-way courses, students named such things as web sites, electronic slides, email, overhead camera shots, video clips, audio clips, guest presenters, live chats via the Internet, library assignments, group discussions on site, and remote group discussions.

Approximately half the student participants (46%) felt as comfortable asking questions and participating in the two-way video class format as in a traditional setting. But, over one-third (38.2%) preferred the regular classroom setting when engaging in class exchanges. Interestingly, nearly fifteen percent (14.8%) were more comfortable asking questions and entering into discussions within the two-way video framework than in the standard classroom.

In terms of overall impression of two-way video courses, a sizable majority (66.9%) of students participating in two-way video classes thought that their knowledge of the subject matter had increased. And, a similarly large majority (70.8%) felt they had learned as much or more as would have been the case in a traditional class setting. When asked if they would recommend someone else take a course using two-way video, over half (55.6%) indicated they definitely would. Another one-fourth (27.7%) would, but only if that was the only way the person could get the course. Fifteen percent (15.6%) said they would not recommend the two-way video format to someone else.

What did the students like least about taking a course via two-way video? The two concerns most often listed were technical difficulties, and not having the teacher in the room. What did students like most about taking a course using the two-way video system? They are offered a variety of reasons. But, the most often mentioned ones were: interaction with other schools, meeting new people, getting to know other students, earning college credit, and having a different experience.

Spring 2000 Narrative (Charts and Table in Appendix I)

The general demographics of the students participating in courses delivered via the two-way video system are as follows. More than half of the student participants were female (57.5%). Three-fourths (75.4%) were twelfth graders with the remaining students fairly evenly divided among grades 9, 10, and 11. A majority (63%) of the students taking two-way video courses was white. About two-thirds of the students (62%) were taking the two-way video courses as an elective, while the other third (36%) were taking the classes as required courses. About half the students were taking the two-way video course for regular school credit, while one-fourth were seeking college credit, and about twenty-nine percent were enrolled for a combination of school and college credit. Slightly more than half the students (59%) in the two-way video courses took the class at a remote site, while about one-fourth (27%) participated in the broadcast studio location. The median response (114) to the question regarding how many fellow students were at the same location taking the two-way video course was 6 to 10 others. However, two students indicated they were participating alone at their location, and none said they were with more than 20 other students. Less than half (39%) of the students were taking their first two-way video course. However, no students indicated they had taken five or more classes that were offered by this format.

All of the students (100%) stated that they knew ahead of time that their class would be taught using two-way video. A majority (74%) of students indicated that they took the two-way video course because that was the only way it was available for them. Interestingly, nonetheless, was the fact that nearly one in ten took the course in the new format because they wanted to try a new way.

Nearly two-thirds of the students (66.4%) felt that the two-way video course objectives and schedule were made clear to them from the beginning. In addition, nearly eighty-eight (87.7%) indicated that these were provided in writing. A large majority (81%) checked yes when asked if homework and other written assignments were made clear to them in the two-way video classes. Similarly, a large number (92.2%) stated that the two-way video class written assignments and exams were related to the course objectives.

A majority of students generally felt that assignments, homework, and exams related to their two-way video course were returned quickly (37.3% = almost always, 32.1% = most of the time). Slightly over half (53.4%) of the students indicated that assignments were returned in three days or less. And, twenty-seven percent received their assignments back in 5 days for less. A third of the students in the two-way video classes indicated that their assignments were returned slower than in standard courses. However, about two-thirds (64.5%) of the two-way video students believed assignments were returned as quick or quicker compared to traditionally delivered classes.

A majority (60.6%) of students stated that two-way video course instructors did set specific times for students to contact them outside class hours. A little more than half indicated that they actually contacted their teachers some or often. Students contacting teachers used a variety of methods including the telephone, email, mail, and fax. Similarly, assignments were submitted via mail, fax, and email.

Only about half (51.5%) of the responding students believed that their two-way video teachers were skilled in using the system. However, about forty percent (40.3%) indicated their teacher's skills using the two-way system improved during the course. Fourteen percent of the students reported that the two-way video courses often experienced technical difficulties. Most students at remote sites reported that a facilitator was present when the two-way courses were being delivered.

Students generally did not feel that teachers used a variety of teaching methods very often in the two-way video courses (only 23.2% checked the often response). Another third (34.6%) of the students did indicate that their teachers used a variety sometimes. Thirty-four percent stated that their teachers either not, very often, or rarely if ever used multiple teaching methods. Interestingly, though, a majority (72.8%) of the two-way video students believed that their two-way video teachers used at least the same or more teaching methods compared to what they experienced in standard courses. When asked to name the media and teaching methods teachers used in the two-way courses, students named such things as web sites, electronic slides, email, overhead camera shots, video clips, audio clips, guest presenters, live chats via the Internet, library assignments, group discussions on site, and remote group discussions.

Less than half of the student participants (39.8%) felt as comfortable asking questions and participating in the two-way video class format as in a traditional setting. Nearly thirty-one percent (30.8%) preferred the regular classroom setting when engaging in class exchanges. Interestingly, about sixteen percent (16.4%) were more comfortable asking questions and entering into discussions within the two-way video framework than in the standard classroom.

In terms of overall impression of two-way video courses, a sizable majority (61.9%) of students participating in two-way video classes thought that their knowledge of the subject matter had increased. And, a similarly large majority (73.1%) felt they had learned as much or more as would have been the case in a traditional class setting. When asked if they would recommend someone else take a course using two-way video, nearly half (46.6%) indicated they definitely would. Another one-third (31.7%) would, but only if that was the only way the person could get the course. Seventeen percent (17.2%) said they would not recommend the two-way video format to someone else.

What did the students like least about taking a course via two-way video? The two concerns most often listed were technical difficulties, and not having the teacher in the room. What did students like most about taking a course using the two-way video system? They are offered a variety of reasons. But, the most often mentioned ones were: interaction with other schools, meeting new people, getting to know other students, earning college credit, and having a different experience.

Support Services Evaluation (Technical Support, Faculty Support, Students)

Support services varied from one project to the next. Generally, the Project Directors were pleased with the initial support of the supplying companies, although there was some concern about responsiveness in the early stages. None of the projects kept service records or problem records that could be used to determine the relative delays, downtime, and lost class time. The Project Directors were generally satisfied that the systems worked most of the time and that technical problems were not a major problem.

During site visits in spring 1999, the Evaluation Team completed technical evaluations. Overall the technical quality was excellent for the need. Classroom

instruction was transmitted at high levels of bandwidth in most all cases. The vast majority used transmission rates at 1.5MB or higher enabling apparent full motion video with high quality audio. The camera systems were more than adequate and gave both sufficient resolution and color rendition. A synopsis of the sites visited follows: (The complete description of connectivity and technical support can be found in the Project Case Studies in Appendix K.

Aiken County Schools have access to both ISDN and dedicated DS-1 services. All transmissions are at a more cost effective 384K(1/4T-1) and the dial up service gives each school greater flexibility in connecting to a wider range of institutions and services. Reliability is high and the district has excellent staff support. Even though the bandwidth is less than the others, it is more than adequate for the transmissions.

Beacon has integrated the two-way system into their overall operations linking the schools in their project with 384K and dial up services.

Berkeley County Schools use dedicated DS-1 facilities provided by three separate phone companies with bridging provided by one of the companies. All transmissions were at 1.5MB. Reliability had been good due to the Home Phone companies dedication to the project. The school district did not have a true technical support person to assign to the project. In the future this could pose problems, leaving them to rely solely on the companies to provide al support. Another concern is the lack of clear cost figures, since some of the charges have never been finalized.

The Governor's School for Science and Math used a dedicated DS-1 network provided by the local phone companies and transmitted at 1.5MB. Cost concerns were an issue with the people there and they may change to satellite broadcasts in the future. The signal quality again was good and they confirmed that the systems work with a high degree of reliability. Technical support was again in the hands of the local providers.

Greenwood/Piedmont TEC used technology for transmission that is of the highest quality. They utilized donated fiber optics for some of the links and filled that in with telephone company provided DS1 service. They operated over an ATM system, which allows for the most flexible bandwidth allocation. Piedmont TEC provided a technical staff person to coordinate the operation and upkeep giving them a high rate of reliability

as well as quick response time. The Piedmont staff also monitored the programs to ensure quality transmissions.

Horry Georgetown uses a fiber optic system capable of very high bandwidth. Transmissions are at 1.5MB providing high quality pictures. As with the other networks, reliability is high.

Orangeburg schools are connected via DS-1 service and transmit at 1.5MB. Video quality is excellent and the system established by BellSouth appeared reliable. Technical support was clearly in the hands of the telephone company. True reliability figures and service response can not be made since they were just beginning classroom instruction on a regular basis.

Trident: Links St. Johns, Fort Dorchester, and Clark Academy with Trident Technical College with 384K.

Comments and Recommendations Related to Technologies

Most of the actual systems are VTEL codecs, which will make later interchange easier because of system compatibility. All systems need the capability to interface with system at 384K. 384K provides the most cost-effective transmission at a good quality. 384K is prevalent in business and higher education and has become a common denominator for codecs.

Most of the school networks were consortiums of phone companies and cable systems. Clear billing and rates were still unclear and in a few cases some of the entities had not received all the bills after a year of service. Some of the companies were giving heavy discount during the trials. For this reason a good cost evaluation can not be made, nor can log term recommendations for new systems occur. Over the long haul this must be a concern because changes in personnel can result in sudden shifts in cost.

Another concern is long term technical support of the network. Clear lines of responsibility and firm service contracts must be established when working with three or four network providers. A single point of contact must be established and they are responsible for coordination between providers. To go along with this, the schools should maintain trouble logs that not only include outages but scheduling conflicts as well. This is needed in order to guarantee a high level of service.

Maintenance contracts, as the equipment ages, are also a problem. These can be become high in the third or fourth years. As the equipment ages more problems will arise. A state contract for service should be established and provided to all school networks.

System design was consistent. All the rooms were virtual copies of each other. Camera placement and room layouts were predictable and unimaginative. More consideration to camera/eye contact and sight lines should be given. Microphone cables were exposed and susceptible to damage. Classroom environments were often barely adequate. Better room acoustics, sound isolation, wall coverings and heating and air systems need more attention.

Observed classes for the most did not utilize fully the 2-way interaction. Most were standard lectures with the return video loop providing little more than class monitoring. Students answering questions only used the audio to provide detail. The most effective use of the two way video was to give the instructor an easy way to make personal contact with the distant student.

Subsequent visits and discussions with the Project Directors in the spring 2000 as well as focus groups conducted in spring and summer at the Regional Workshops confirm that the systems in place in the fall did not change significantly during the spring. Also, the general maintenance and cost concerns remained the same. Most Project Directors would like to have some assistance in developing more cost effective maintenance and upgrading the existing systems that are rapidly becoming outdated by newer technologies.

Information Resources Evaluation

The respondents indicated that they used their systems for a range of other applications such as bringing in experts, connecting to zoos, board meetings, team learning, collaborative learning, and others. At this time it is difficult to assess the extent to which the two-way system itself was used in all of these reported instances or whether the school's connection to the Internet was interpreted by the respondents as a "use of the system." There were some good examples, however, such as linking with the SC Honors College, bringing in a smoke jumper, and board meetings that suitably impressed the

participants. There appears to be limited use of the systems beyond class delivery that needs to be carefully considered by local directors if they expect to develop a cost effective system. The systems continue to be used on a very irregular basis for enrichment; however, as the various project participants have begun to share, additional applications of the systems have expanded. This is not a significant use of the systems by any measurement.

Partnerships Evaluation

The partnerships established thus far primarily have been those developed among the partners at the state level. However, there are notable examples of schools working with technical colleges, other institutions of higher education collaborating with schools for student courses and faculty development, and some local education/business partnerships. The projects are just now reaching the point that they are beginning to consider sharing expertise and courses among themselves. Notably is the Aiken Project now working with Allendale and the University of South Carolina. Also, the Regional Workshops held in Aiken County in the spring and Horry County in the summer has helped to foster collaborative activities. Likewise, the continued conversations involving SCETV and those in the 2-Way projects have the potential for schools using all available resources for distance learning.

Management and Administration Evaluation

Generally, the projects have been fiscally managed well; however, there is a continuing need to develop stronger lines of communication among many of the schools in the various projects. The projects developed as a part of a larger networking plan naturally have progressed more rapidly; however, with one exception the projects as proposed have met their goals and objectives. Record keeping has not been as complete as needed to monitor and assess some of the overall operations of the various project elements. One of the most daunting concerns has been the inability on the part of the Project Directors to accommodate bell schedules. Another concern is the lack of coordination within school districts by principals to take advantage of distance learning potential. Maintenance records have been some of the most challenging pieces of information to interpret during the process of this evaluation.

Problems Solved and Cost Savings (See Appendixes K-N for Full Cost Comparisons)

Almost all of the respondents indicated from the beginning and continuing into Phase II of the project that the problems solved have been those related to time and distance--using the system to reach out to students and teachers who otherwise would not have access to courses or staff development. Costs of travel for participants were also indicated as a savings; however, none actually put a dollar value on that. In the past, some have argued that a tremendous cost savings can be realized if one considers only the salaries of the teachers required to teach the same number of courses in the additional schools. The following Table 4 shows the costs of offering the same number of courses in the schools that received the distance education courses as a part of the Pilot Projects. It has been suggested that this is a "cost avoidance" figure rather than a "cost savings" figure.

Table 4
Total Possible Cost Avoidance
Based on Personnel Costs Only
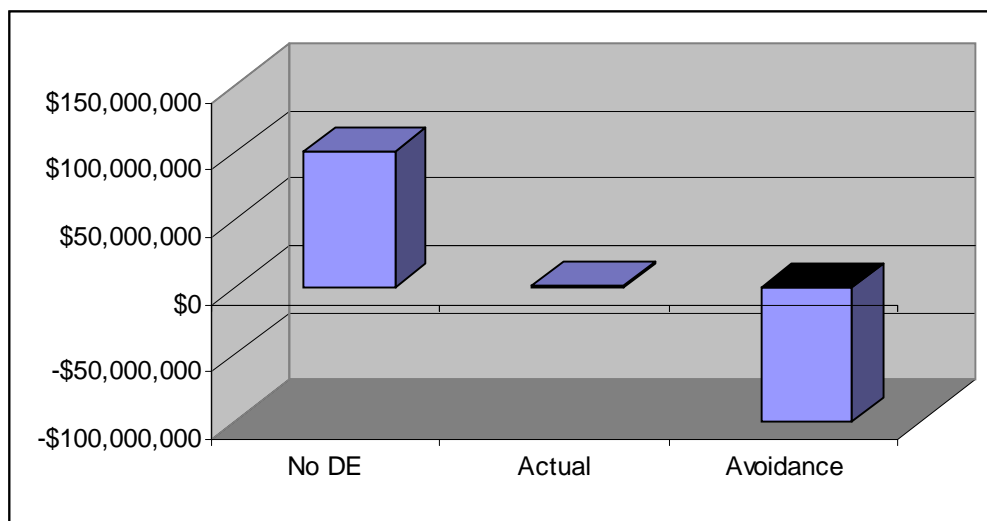
According to the average cost of providing a class based on the average salaries for teachers provided by the South Carolina State Department of Education and estimated salaries for teaching assistants provided by the Project Directors, each class costs approximately $4,764. Based on this cost, the savings for the number of schools and

courses offered using distance delivery is impressive. For example, if the same number of courses as offered using the distance delivery systems (143) were to be offered in individual schools (221), the cost just for instructional staff would be $150,548,972. Using distance delivery systems with one faculty teaching to one or more other schools, the cost is $681,217. This suggests a cost savings/avoidance of approximately $149,867,755.

Another way to consider the cost is to assume that a teacher's salary is $32,000 (based on South Carolina Department of Education data from 1997), and he/she teaches three courses on a 4x4 block, and there are two semesters, so there are a total of 6 courses. His/her salary per course is about $5,300. If schools had to teach 172 courses without distance delivery, and could do the same thing with only 115 courses using distance delivery, the difference is 57 courses. At $5,300 per course, this is a savings of $302,000. However, this figure does not take into account the range of special courses for which there is already a critical need in the state. The cost savings is one factor, access to faculty expertise is another.

Such figures are interesting; however, if one considers the economic conditions of many of the receiving schools and the fact that spending per school in their areas is not likely to be significant, the teachers simply would not be hired and the courses would not be offered.

Knowing that education does cost and often is expensive, it is important to consider the apparent real costs of these projects. Factoring in all the operating costs the total costs for the first three years of operation is $4,198,148 for the courses delivered (Table 5). This breaks down to $1,548 per student, $14,679 per course, and $18,996 per receiving school.

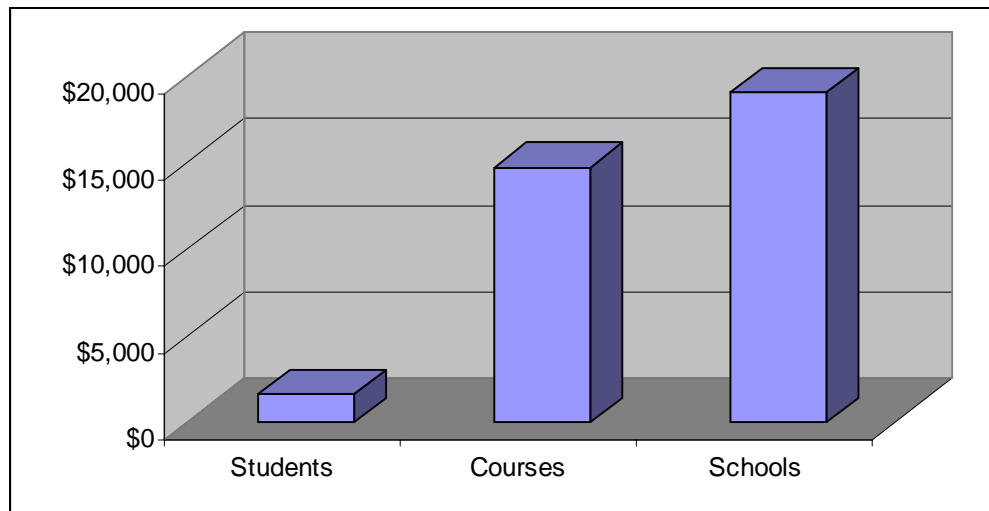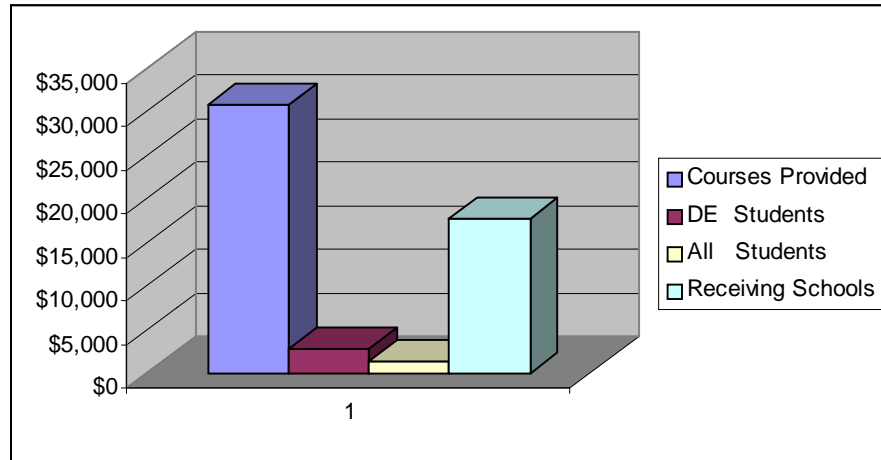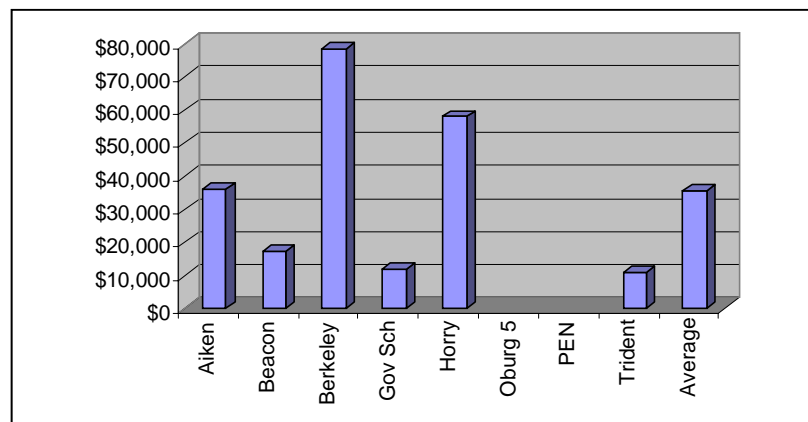**Table 6**
One Time Costs Per Course, DE Students,
All Students, and Receiving Schools


The total one time costs of the projects to date amount to $3,153,124 which means the cost per course offered is $22,050, the cost per receiving school is $14,268, and the cost per distant student is $2,232 (Table 6). The average one time cost per project for start up was $450,446 with the range from Horry's $306,430 to Berkeley's $631,634. Start up costs include purchasing equipment, instillation, and remodeling facilities.
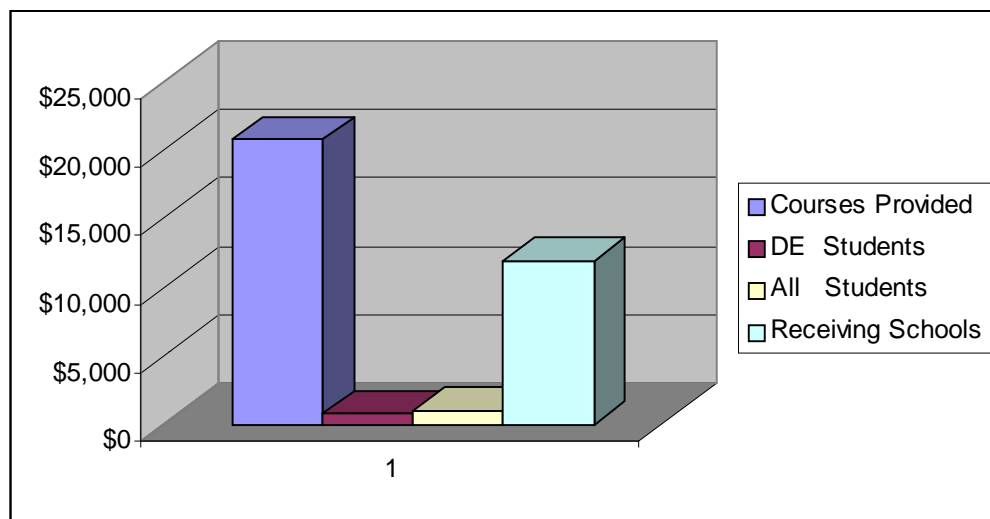
Table 7
Technology Staff Costs

Technology staff costs (Table 7) average $38,050 per year for the projects. The PEN Project Directors indicated that the costs were absorbed by their staff as a part of their regular duties. There were no reported additional costs from Orangeburg 5.

Table 8
Administrative Costs
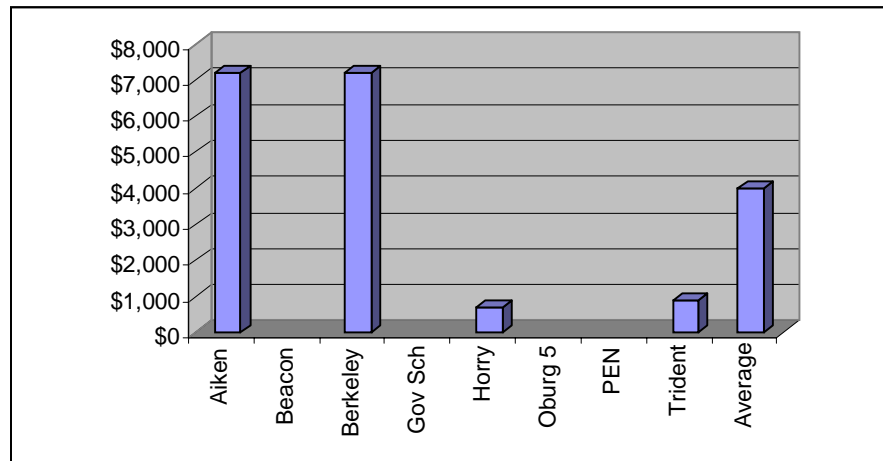
The costs reported for administering the projects (Table 8) ranged from Aiken's $7,200 per year to Trident's $880 per year. The Beacon, Governor's School for Science and Math, Orangeburg 5, and the PEN projects absorbed the costs of administration as a part of their regular duties and were not costed specifically for the courses offered via two-way video.

Table 9

Annual Operating Costs Per Course,
Per DE Student, Per All Students, Per Receiving Schools

Based on the annual operating expenses reported for the projects in the fall 1999 and verified by the Project Directors in spring 2000 (Table 9), each course costs $17,242 per year, $698 per distant learner, $907 per student for all learners, and $11,57 for each receiving school.

Comparison with General Education Costs

According to the most recent information from the South Carolina State Department of education, in 1997 (the last year data are available) the cost per pupil to operate the S.C. K-12 education system as $5758. This includes classroom instruction, administration and guidance, transportation, and other operations. If one considers just the cost of the teacher and classroom materials, the cost is $3100 per pupil. So at a minimum, the cost of operating an average S.C. K-12 classroom of 20 students would be $62,000. Or, the cost of providing the total system to accommodate 20 students in a classroom would be $115,160. This does not include the cost of the physical facility. Assuming a new classroom would cost around $100,000 today, and assuming a classroom lasts for 50 years, the amortized cost classroom facility would be about $2000 per year. This would need to be added to the cost of providing the instruction and to other support costs. Since the figures are three years old, the cost should be adjusted up to 12%.

For the purposes of this report, it is useful to break the costs down into what the cost of one course would be in order to compare with the costs presented from the data gathered from the Project Directors. Table 10 includes the data adjusted for the year 2000.

Table 10
Costs Reported by the
South Carolina Department of Education
1997 adjusted for 2000

	SC Gen	Student	Faculty	Class	Facilities	Fac+Class
1997 data	$115,160	$5,758	$3,100	$62,000	$2,000	$64,000
12%	$13,819	$691	$372	$7,440	$240	$7,680
Adjusted	$128,979	$6,449	$3,472	$69,440	$2,240	$71,680
Cost/Period	$16,122	$806	$434	$17,360	$560	$8,960

Comparing these data to those reported in the fall 1999 and spring 2000 (Table 11), it is obvious that the courses being offered via distance learning technology vary from courses provided generally in the schools. The caveat; however, is that were it not for the existing facilities and other services provided by the schools, these courses could not be provided. On the other hand, it appears that offering courses in this manner are not an outrageous expense.
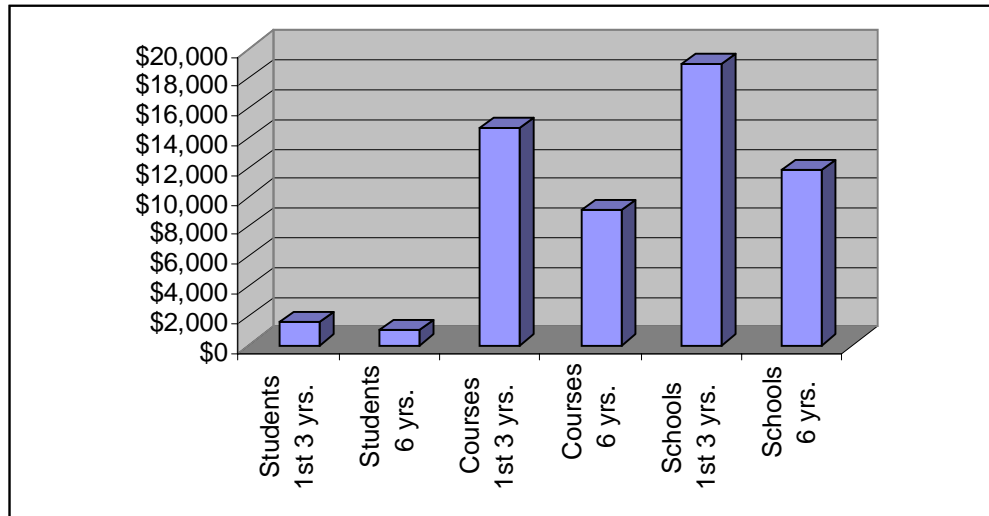
Table 11
Comparison of SC General Education Data
to Pilot Project Data
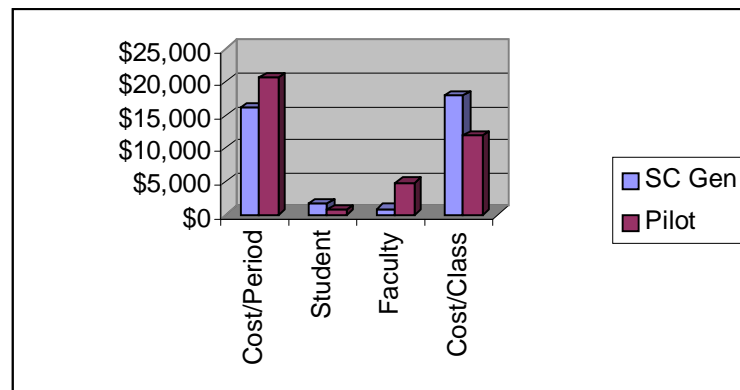
Projecting costs are difficult, especially with the many changes in technology and its application. However, it may be useful to consider the costs of offering the same number of courses as has been offered using the delivery costs reported in fall 1999 and spring 2000. Table 12 presents the data that come from amortizing the costs of the equipment and keeping all other costs at the same level and not factoring in inflation rates or increasing salaries for teachers and technology staff. The total costs for the six years with such a scenario is projected to be $5,360,928. The cost per student for the first three years is $1,566 and at the end of the six years is projected to be $986. Per course the range goes from $14,885 to $9,372 and per school from $19,263 to $12,129 from year 3 to 6. The complete data tables are presented in Appendix M and N.

Table 12
Cost Comparisons for First Three Years

with Total Six Years

Returning again to the cost avoidance discussion. Over the life of the projects, were they to remain stable, the cost avoidance just could be approximately $1,088,412. In Table 13 the data for this comparison for the six years of the initiative are displayed. The complete data tables are presented in Appendix M and N.

Table 13
Possible Cost Avoidance for Years 3 through 6
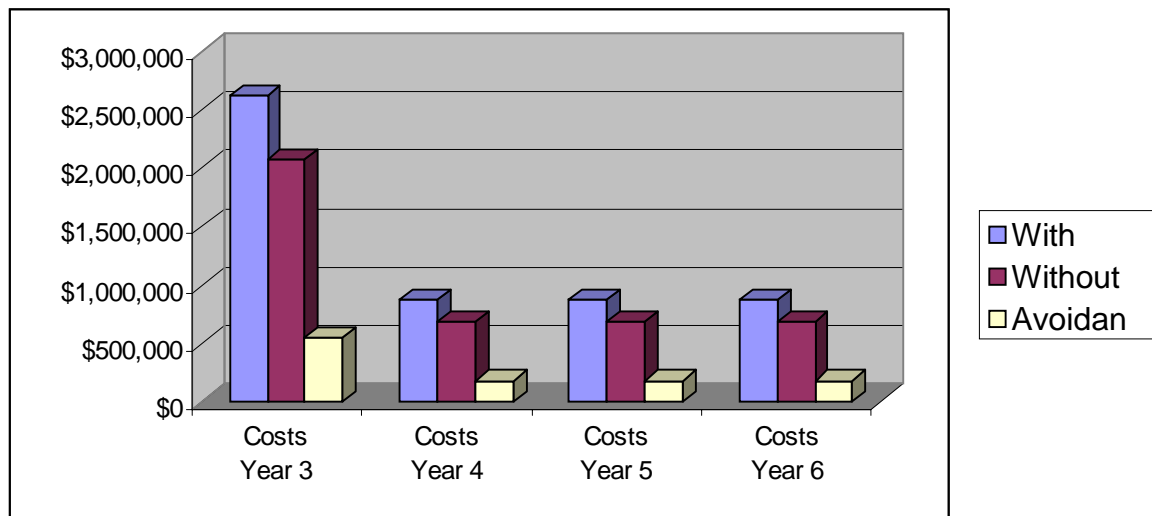
As stated previously, it is obvious that the schools served by the current distance learning initiative, most of which are rural and in economically depressed areas, could not afford to offer these courses regardless of their students' needs. It is obvious also that the cost of delivery for distance learning is significant, yet it is near the costs for delivering courses in the traditional classroom. The question is whether these schools can afford the actual costs of delivery. Other critical questions that result from this evaluation include the following: Can the systems be expanded to increase economies of scale? Can the systems be used in combinations with other systems such as the South Carolina Educational Television Network to make both learning effectiveness and cost effectiveness possible? Can the State afford to not use every means possible to bring education to children who will have participate in and create the next Knowledge Society?

Continued Staff Development in Distance Education

Most of the Project Directors indicated that they had offered limited staff development for their distance teachers and a few indicated that they had used the system to bring in staff development for other teachers. The use of the systems for this purpose was very limited and additional uses need to be considered. Most of the Project Directors indicated that they needed to continue staff development for new teachers who will be using the system and some indicated that they would like more advanced development activities related to distance teaching and learning. The current Project Directors are working with the South Carolina Partnership for Distance Education in an effort to obtain improved faculty and staff development for the projects, but also to provide others in the State with opportunities to learn from the current projects.

Next Level Needs

Respondents were asked what they would do to take their systems to the next level of quality and service. Almost all indicated, as stated above, that they needed resources to expand their network to include more of their schools. Generally they would like to do more of the same. It is suggested that if the various projects could share more with each other and with other educators in South Carolina, we all may gain greater insight as to the potential of these distance learning delivery systems.

Recommendations

  Based on the outcomes of Phase I of the K-12 Distance Learning Initiative, the following recommendations are made by the Team:

1. Competitive Grants Need to be the Way of Funding Future Projects

Additional funding for projects such as this must come from competitive grant applications that include a strong emphasis on learning outcomes and integrating the various technologies into existing and demonstrated curricular need. Technology applications are only as good as the goals that individuals, schools, and districts are willing to work toward. This requires a clear vision of learning needs, strong content development, rigorous assessment, collaborative planning, and ongoing communication at all levels.

2. Staff Development for Distance Learning

  In South Carolina and as reported nationally, the most critical need among distance learning projects whether delivered by the satellite, two-way interactive distance learning or the web, assisting South Carolina educators to develop and provide distance learning programs effectively. Very often, teachers have been given a brief introduction to the basic operation of the equipment needed for two-way communication. Most have not had the opportunity to learn how to incorporate many of the unique and useful features of the systems, nor have they learned how to incorporate many of their own tried and proven teaching techniques into this new environment. Regular, initial and ongoing development opportunities are essential if we are to realize the full potential of our capital investments. This includes opportunities for teachers to share experiences by discipline as well as learn from other distance educators who have many years of experience by establishing quality staff development for distance learning educators through pre-service and in-service opportunities.

3. Reduced Rates for Connectivity

  The average annual costs for connectivity reported for the Phase one of the projects is $60,788 per project. It is imperative that we find a way to reduce connectivity

rates and identify long term funding sources if we hope to connect many of our schools who will not be able to afford these charges regardless of how many courses their students may need.

4. Funding for SC Schools

School districts in South Carolina need monetary resources to expand their network to include more of their schools. An important part of interactive distance learning is the promise of greater communication and sharing among districts which will result in better integration with the academic needs to accelerate learning

As the K-12 Partnership continues to support two-way interactive distance learning as part of the technology delivery system to improve education in SC, the educational opportunities in our state will increase. It is important that each district analyze its curricular and instructional needs while seeing how interactive distance learning can be integrated into the district's overall technology delivery system.

5. Collaboration and Cooperation among Projects and Systems

South Carolina is fortunate to have the levels of connectivity that are not available in many states. South Carolina was among the first to have every school wired for the Internet and is leading many states in its provision of Internet access to the classroom. Every public library in the State is connected to the Internet, and South Carolina was among the first to accomplish this important service for its citizens. South Carolina Educational Television remains a benchmark for excellence in educational programming, production of quality instructional materials, and providing satellite and compressed video links to schools, public libraries, health care facilities, government agencies, and businesses in the state. It is critical that the Phase One and Phase Two of the K-12 Distance Learning Initiative continue to work together to share ideas, information, and instructional programming. It is critical also that all of the systems for distance learning be considered as complementary technologies that together provide unparalleled access for our children, youth, and adult learner populations that few states enjoy. Continued collaboration among the existing projects, active solicitation of additional partners, and

planning for inclusion of all 86 school districts for distance learning systems must be a priority. By effectively integrating the different types of distance learning, educators are changing the way South Carolina learns by creating electronic classrooms that accelerate the learning opportunities for our students.